

**WHAT IS CLAIMED IS:**

1. An on-line gloss/density meter for an electrostatographic reproduction apparatus in which pigmented marking particle images are fixed to receiver members respectively by application of heat and/or pressure as such receiver members travel along a transport path through a fuser assembly, said on-line gloss/density meter comprising:

at least one light emitter for emitting a collimated light beam, said light emitter mounted in operative association with said transport path;

at least one light collector, mounted in operative association with said at least one light emitter and said transport path to detect light from said at least one light emitter, reflected from a receiver member transported along said transport path, and produce a signal corresponding to such reflected light;

a guide element associated with said transport path for directing a receiver member into a predetermined specified location relative to the beam of light from said at least one light emitter to reflect light toward said at least one light collector; and

a logic and control unit for controlling operative parameters of said electrostatographic reproduction apparatus, said logic and control unit responsive to signals from said at least one light collector, whereby upon said at least one light collector providing appropriate signals, said logic and control unit precisely controls operating parameters for said electrostatographic reproduction apparatus to control, on-line, gloss and/or density.

2. The on-line gloss/density meter according to Claim 1, wherein said light emitter is located substantially immediately downstream, in the direction of receiver member travel, from said fuser assembly.

3. The on-line gloss/density meter according to Claim 1, wherein said transport path is defined by flat sheet-metal plates having a suitable opening through which a light beam can be reflected from a receiver member, and said guide element includes an urging member, mounted relative to said flat sheet-metal plates, suitable for urging a receiver member transported along said transport path into a repeatable, accurate, predetermined spacing relative to said opening and said light emitter/light collector.

4. The on-line gloss/density meter according to Claim 3, wherein said urging member is a bronze leaf spring.

5. The on-line gloss/density meter according to Claim 1, wherein said transport path is defined by wire-form guides having a suitable opening through which a light beam can be reflected from a receiver member, and said guide element includes an urging member, mounted relative to said wire-form guides, suitable for urging a receiver member transported along said transport path into a repeatable, accurate, predetermined spacing relative to said opening and said light emitter/light collector.

6. The on-line gloss/density meter according to Claim 5, wherein said urging member is a spring.

7. The on-line gloss/density meter according to Claim 5, wherein said urging member is a bronze leaf spring.

8. The on-line gloss/density meter according to Claim 1, wherein said at least one light emitter includes a white light LED, and fluorescent plate whereby said collimated light beam is a white light with a high blue intensity, such that contrast for yellow patches on a receiver member is improved.

9. The on-line gloss/density meter according to Claim 8, wherein said LED is a UV-LED.

5 10. The on-line gloss/density meter according to Claim 9, wherein optics of said LED is mounted in and integrated with a tube having a blackened interior surface so that, a substantially collimated light beam is produced from the emission by said LED.

10 11. The on-line gloss/density meter according to Claim 8, wherein said florescent plate includes a circular aperture, whereby said aperture is cheaper and easier to make, with good accuracy.

15 12. The on-line gloss/density meter according to Claim 1, wherein said at least one light collector includes a lens and a suitable photodiode mounted adjacent respective ends of a tube formed by elements having a threaded interface which serves to enable said photodiode to be accurately positioned exactly in the focus of said lens, said elements having a blackened interior surface.

20 13. The on-line gloss/density meter according to Claim 12, wherein said photodiode has a built-in  $V\lambda$  filter in order to best simulate the spectral response of the human eye.

25 14. The on-line gloss/density meter according to Claim 13, wherein said a circular aperture is provided for said photodiode, whereby said aperture is cheaper and easier to make, with good accuracy.

15. The on-line gloss/density meter according to Claim 1, wherein  
said at least one light emitter and said at least one light collector are respectively  
oriented at approximately  $60^\circ$  from opposite sides of the vertical so that a signal from  
said light collector detects specular reflected light corresponding to gloss of a receiver  
5 member surface, and said logic and control unit, in response to such signal, controls  
operative parameters of said fuser assembly to control gloss.

16. The on-line gloss/density meter according to Claim 1, wherein  
said at least one light emitter and said at least one light collector are respectively  
10 oriented at approximately  $45^\circ$  or less from opposite sides of the vertical so that a  
signal from said light collector detects direct reflected light corresponding to density  
of a marking particle image on a receiver member surface, and said logic and control  
unit, in response to such signal, controls operative parameters to control density.

17. The on-line gloss/density meter according to Claim 1, wherein  
said at least one light emitter and said at least one light collector are respectively  
oriented at approximately  $45^\circ$  and approximately  $0^\circ$  from the vertical so that a signal  
from said light collector detects direct reflected light corresponding to density of a  
marking particle image on a receiver member surface, and said logic and control unit,  
15 in response to such signal, controls operative parameters to control density.  
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18. The on-line gloss/density meter according to Claim 1, wherein a plurality of light emitters and a plurality of light collectors are provided; one light emitter of said plurality of light emitters and one light collector of said plurality of light collectors are respectively oriented at approximately  $60^\circ$  from opposite sides of the vertical so that a signal from said light collector detects specular reflected light corresponding to gloss of a receiver member surface; and another light emitter of said plurality of light emitters and another light collector of said plurality of light collectors are respectively oriented at approximately  $45^\circ$  or less from opposite sides of the vertical so that a signal from said light collector detects direct reflected light corresponding to density of a marking particle image on a receiver member surface; whereby said logic and control unit, in response to such signals, substantially simultaneously controls operative parameters of said fuser assembly to control gloss and operative parameters to control density.

19. With a reproduction apparatus in which pigmented marking particle images are fixed to receiver members respectively by application of heat and/or pressure as such receiver members travel along a transport path through a fuser assembly, the method of controlling, on-line, gloss and/or density comprising the steps of:

emitting a collimated light beam, in operative association with said transport path substantially immediately downstream, in the direction of receiver member travel, from said fuser assembly;

guiding a receiver member in said transport path so as to direct such receiver member into a predetermined specified location relative to the beam of light to reflect light;

detecting light reflected from a receiver member transported along said transport path, and producing a signal corresponding to such reflected light; and

responsive to light detection signals, providing appropriate signals, to precisely control operating parameters for said electrostatographic reproduction apparatus to control, on-line, gloss and/or density.